VOLKOVA, T.I., kandidat tekhnicheskikh nauk.

Methods of testing annular specimens for relaxation. Trudy TSNIITMASH 45:187-198 '52. (MLRA 9:2)
(Creep of metals) (Steel--Testing)

VOLKOVA, T. I.

"Relaxation Strength of Spring Steel".
Kotloturbostroyeniye, No 6, pp 21-24, 1953

Presents the results of experimental study of relaxation strength of flat springs used in sealing steam turbines. Shows the relaxation characteristics of springs and gives recommendations for the use of materials for sealing springs during various operating temperatures.
(RZhMekh, No. 8, 1955)

SO: Sum No 812, 6 Feb 1956

USSR/Engineering - Heat treating

Card 1/1 : Pub. 128 - 17/38

Authors : Volkova, T. I.

Title : Influence of temperature on the relaxation stability of steel

Periodical : Vest. mash. 9, 65-67, Sep 1954

Abstract : Tests were conducted to determine the straight-line relation between the temperature and the logarithm of relaxation time, with different straight lines in the temperature intervals of from 200-450°C and from 450-600°C. Technical data on steel compositions are presented. Tables; graphs.

Institution : ....

Submitted : ....

VOLKOVA, T.I., kandidat tekhnicheskikh nauk.

On IA.S.Ginzburg's article.(Letter to the editor).Vest.mash.35 no.9:61-63 S '55. (MLRA 9:1)
(Austenite) (Steel--Testing)

VOLKOVA, T.I., kandidat tekhnicheskikh nauk; FEDYAYEV, V.I., inzhener.

Method and equipment for relaxation tests on flat springs. [Trudy] TSNIITMASH 71:57-69 '55. (MLRA 9:8)
(Creep of metals) (Springs (Mechanism))

VOLKOVA, T.I., kandidat tekhnicheskikh nauk; TSEYTLIN, V.Z., kandidat tekhnicheskikh nauk; PETROPAVLOVSKAYA, Z.N., kandidat tekhnicheskikh nauk.

Method for tensile relaxation testing in a special apparatus. [Trudy] TSNIITMASH 71:70-80 '55. (MLRA 9:8)
(Creep of metals) (Testing machines)

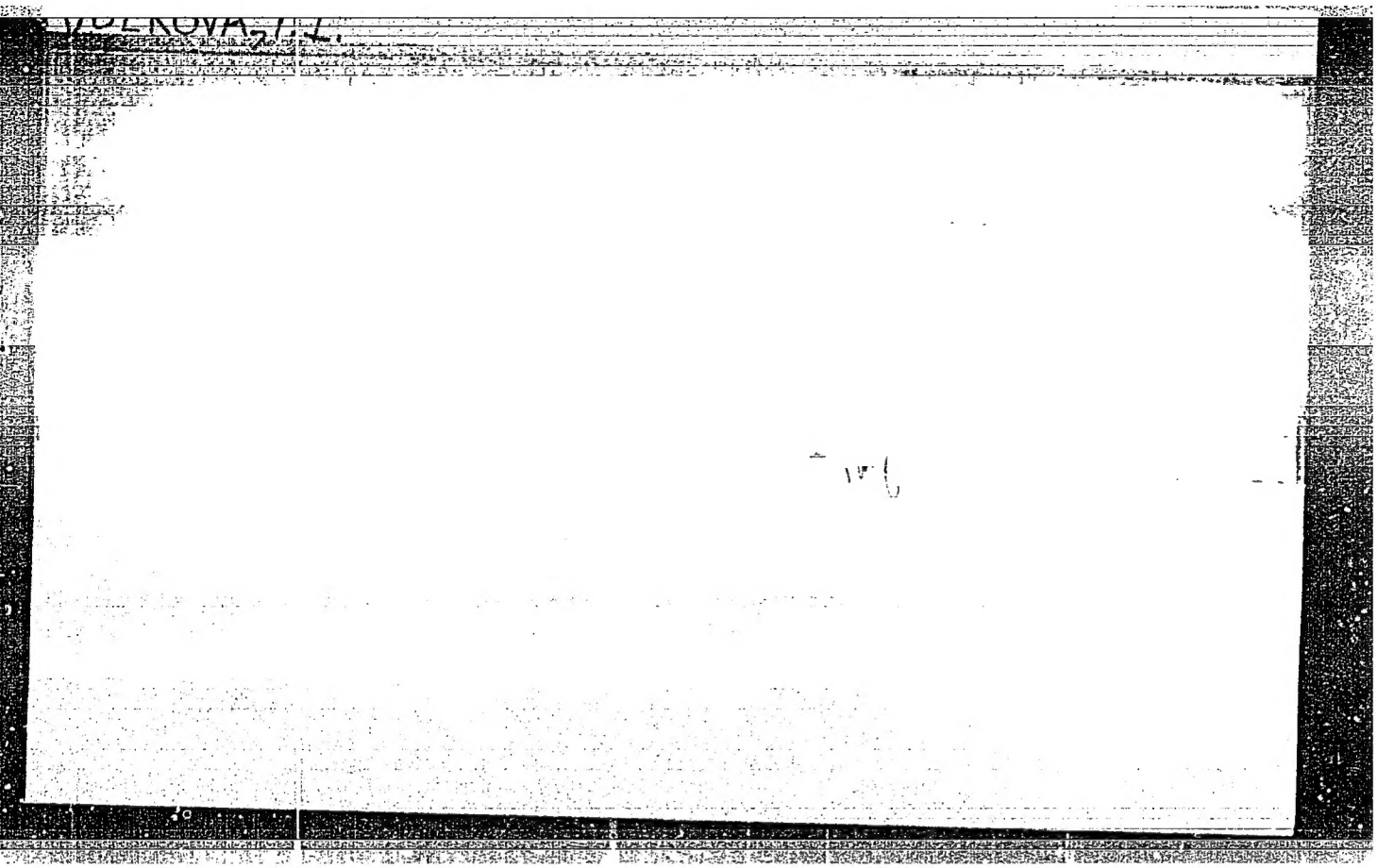
VOLKOVA, T.I., kandidat tekhnicheskikh nauk.

Investigation of steel for steam-turbine packing compression springs. [Trudy] TSNIITMASH 71:192-221 '55. (MLRA 9:8)
(Steel--Testing) (Springs (Mechanism))

VOLKOVA, T.I., kandidat tekhnicheskikh nauk; TSEYTLIN, V.Z., kandidat tekhnicheskikh nauk.

Effect of small additions of alloying elements on the relaxation resistance of carbon steel. [Trudy] TSNIITMASH 71:233-241 '55. (MLRA 9:8)

(Steel) (Creep of metals)



Change in the relaxation characteristics of several steels during prolonged testing (10,000 hours). T. I. Volkova. *Metalloved i Obrabotka Metallov* 1959, No. 1, 18-25. The [illegible] were 4Kh[illegible] [illegible] and Ni traces; E1258, [illegible] Si 0.80, Mn 0.35, Cr 3.75, V 1.53, W 3.27 and Mo [illegible]% and E1723 [illegible] 0.3, Si 0.28, Mn 0.32, Cr 4.1, V 0.4 and Mo [illegible]%. They were hardened and tempered before testing. Also, R18 was tested after Cr plating and 4Kh13 after shot peening. The test specimens were 175 × 25 × 1.5 mm., bending was measured to ±0.01 mm., and temps. were controlled to ±5°. The test temps. ranged from 410 to 510°, and the initial stresses from 50 to 80 kg./sq. mm. The relaxation criteria employed were: (1) the time at which the stress had fallen to 25 kg./sq. mm.; (2) the stress remaining after 10,000 hrs. These were tabulated for 66 tests. Comparison was made of the actual long-time results and those previously predicted by extrapolation from data obtained by tests of 2500–3500 hrs. For testing at 410° the differences were less than 10%, but at 470° the actual results were higher by 100% or more in some cases. Testing for 6000 hrs. at 470° would permit satisfactory extrapolation. Changing the tempering treatment of steel 4Kh13 from 2 hrs. at 530° to 10 hrs. at 550° increased criterion 2 by 50–5%. Cr-plated specimens decreased in stress more rapidly during the first 2000–3000 hrs. but they compensated for this in the later stages. Since Cr plating protected the specimens from corrosion, its use was recommended. The work on shot peening was inconclusive, although at 410° it appeared to be detrimental for relaxation strength but not for corrosion resistance. The new steel E1723, made in 12-kg. lab. heats, was forged like the other steels and was tempered for 6 hrs. at 650° after being air cooled from 1050°. Its relaxation values were: (1) 10,000 hrs.; (2) 49 (410°), 37 (470°) for an initial stress of 62 kg./sq. mm. At 470° it was better than R18. Repeated loading increased (2) of R18 by about 20%. A. G. Guy

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Spring steel with increased relaxation strength. T. I. Volkova. *Metalloved. i Obrabotka Metal.* 1956, No. 12, 12-16; cf. *C.A.* 50, 16618e.—A com. 3-ton heat of steel EI723 was made and tested for comparison with the exptl. heat previously reported. The results were similar. The stresses remaining after 10,000 hrs. at various testing temps. were: for an initial stress of 60 kg./sq. mm.: 410°, 60; 470°, 43; 500°, 35; 525°, 19; 550°, 13; for an initial stress of 50 kg./sq. mm.: 410°, 38; 470°, 29; 500°, 23; 525°, 12; 550°, 9. Results for tests at other initial stresses fell on the straight line given by these 2 points. These values were obtained by extrapolation from 4000 hrs. and were conservative.

A. G. Guy

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Heavy Machine Building

Volkov, T.I.

GINTSBURG, Ya.S., kandidat tekhnicheskikh nauk, dotsent.

On the critical notes by T.I. Volkova, candidate of technical sciences. Vest.mash. 36 no.11:88-89 N '56. (MIRA 10:1)
(Steel--Testing) (Austenite)

AUTHOR: Volkova, T. I., Candidate of Technical Sciences.

TITLE: Process of relaxation under conditions of alternate loading. (Protsess relaksatsii v usloviyakh povtornykh nagruzheniy). 129-7-3/16

PERIODICAL: "Metallovedenie i Obrabotka Metallov" (Metallurgy and Metal Treatment), No.7, 1957, pp. 13-18 (U.S.S.R.)

ABSTRACT: Gintsburg, Ya. S. (6) concludes that the method of alternate loading permits the evaluation of the suitability of a metal to operate under relaxation conditions and also to evaluate whether the correct manufacturing technology (smelting, forging, heat treatment) has been applied. These conclusions are contradictory to conclusions arrived at by other authors. The aim of the work described in this paper was to obtain experimental data on the influence on the relaxation process of the structure and duration of the tests and of intermediate heatings. The influence was investigated of long duration loading (five times) on the relaxation characteristics of iron and on the carbon steels 20 and 40 which have a structure of lamellar and gramular pearlite produced by annealing; the composition and the properties of the investigated materials are summarised in a Table, p.15. The tests were carried out at 400 C by the method of a ring of equal bending resistance applying an initial stress of

Card 1/2

VOLKOVA, T.I., kandidat tekhnicheskikh nauk.

Long-time testing on the relaxation of spring steel. [Trudy] TSNIITMASH no.79:149-158 '57. (MLRA 10:6)
(Creep of metals) (Steel--Testing)

L 24447-66 EWT(m)/EWP(w)/T/EWP(t) IJP(c) JD/HW/JT/GG
ACC NR: AT6010582 (N) SOURCE CODE: UR/0000/65/000/000/0161/0165

67
AUTHOR: Larikov, L. N.; Mirkin, I. L.; Zasimchuk, Ye. E.; Volkova, T. I. 66
B+1

ORG: Institute of Physics of Metals, AN UkrSSR (Institut metallofiziki AN UkrSSR); TsNIITMASh, State Planning Committee, SSSR (TsNIITMASh pri Gosplane SSSR)

TITLE: Investigation of the effect which charge purity and melting conditions have on the high-temperature strength and rate of growth of recrystallization centers in deformed nickel- and iron-based alloys

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov. (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 161-165

TOPIC TAGS: nickel base alloy, iron base alloy, refractory alloy, metal recrystallization, high temperature strength

ABSTRACT: The authors study the effect of purification (by melting in a vacuum and using charge materials refined by vacuum remelting) on the rate of growth of recrystallization centers and the refractory properties of multicomponent alloys. The specimens were complex austenite alloys based on iron (0.05% C, 15% Cr, 32% Ni, 6% W

Card 1/3

L 24447-66

ACC NR: AT6010582

and 3% Mo) and nickel (0.05% C, 13% Cr, 6% Mo, 6% W, 6% Co) containing no titanium or aluminum, i.e. the quantity of excess hardening phases was at a minimum. The alloys were melted and teemed under various conditions: 1. in air from commercially pure metals (1N and 1Zh where N indicates a nickel-based alloy and Zh indicates an iron-based alloy); 2. in a deep vacuum ($1 \cdot 10^{-4}$ mm Hg) from commercially pure metals (2N and 2Zh); 3. in a deep vacuum from metals previously remelted in a vacuum (3N and 3Zh). Specimens measuring 5×5×10 mm were cut from the ingots and annealed for 8 hours at 1150°C and then deformed to 80% by uniaxial compression at room temperature. The specimens were then subjected to recrystallization annealing with holding from 15 minutes to 8 hours at temperatures of 650-800°C. The temperature during annealing was held constant to within ±1°. A surface layer of the order of tenths of a millimeter was removed by etching in aqua regia (nickel alloys) or in an alcohol solution of nitric acid (iron alloys). The rate of growth of the recrystallization centers was evaluated from the time necessary for reaching the first centers of a given size at a given temperature. It was found that the high-temperature strength of iron alloy is considerably increased by melting and teeming in a vacuum. Graphs are given showing the linear rate of growth in recrystallization centers as a function of temperature. These curves show that charge purity and melting conditions have a weak effect on the rate of growth of recrystallization centers

Card 2/3

L 24447-66
ACC NR: AT6010582

throughout the entire range of temperatures and annealing times studied, although a tendency for acceleration of recrystallization processes was observed in more highly refined alloys. Empirical formulas are given for determining the rate of growth in recrystallization centers for nickel and iron alloys. Orig. art. has: 1 figure, 3 formulas.

SUB CODE: 11/ SUBM DATE: 16Sep64/ ORIG REF: 006/ OTH REF: 005

Card 3/3 dda

DEKHTYAR, I.Ya.; MIRKIN, I.L.; MIKHALENKOV, V.S.; FEDCHENKO, R.G.; VOLKOVA, T.I.; BLANTER, M.S.

Investigating the paramagnetic properties of heat-resistant alloys on an iron and nickel base. Issl. po zharoproch. splav. 10:87-92 '63. (MIRA 17:2)

ACCESSION NR: AT4013932 S/2659/63/010/000/0087/0092

AUTHOR: Dekhtyar, I. Ya.; Mirkin, I. L.; Mikhalenkov, V. S.; Fedchenko, R. G.; Volkova, T. I.; Blanter, M. S.

TITLE: Investigation of the paramagnetic properties of high temperature alloys on an iron and nickel base

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochn*m splavam, v. 10, 1963, 87-92

TOPIC TAGS: paramagnetic steel, high temperature alloy, iron alloy, nickel alloy, chromium alloy, alloy paramagnetic property, paramagnetism

ABSTRACT: The temperature dependence of the paramagnetic properties of high temperature alloys on an iron and nickel base was investigated as a guide to their electronic structure and the effective number of electrons N. It was found that the maximum number of electrons for nickel-chromium alloys is found in those containing 10% Cr. Addition of niobium to an alloy of Ni + 16% Cr leads to significant increase in N. Investigation of complex alloys on a nickel-chromium base showed that the maximum N is observed in alloys with aluminum and titanium. Investigation of complex alloys on an iron-nickel-chromium base showed

Card 1/2

ACCESSION NR: AT4013932

that the effective magnetic moment connected with N is maximal in alloys containing tungsten and molybdenum, while niobium, titanium and aluminum lead to a decrease in N. The results obtained and their comparison with tensile strength studies show that the number of electrons in the bond found on the basis of the temperature dependence of paramagnetic sensitivity may characterize the strength of the interatomic bonds at high temperatures. Orig. art. has: 3 figures, 2 tables and 9 formulas.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute AN SSSR)

SUBMITTED: 00 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: ML NO REF SOV: 002 OTHER: 000

Card 2/2

GERTSRIKEN, S.D. [deceased]; SLASTNIKOVA, L.F.; YATSENKO, T.K.; VOLKOVA, T.I.; MIRKIN, I.L.

Regularities of nickel diffusion in nickel-base alloys compared with the heat resistance properties of these alloys. Issl. po zharopr. splav. 9:42-46 '62. (MIRA 16:6)
(Nickel alloys—Thermal properties) (Diffusion)

MIRKIN, I.L., doktor tekhn.nauk; VOLKOVA, T.I., kand.tekhn.nauk; BLANTER, M.S., inzh.; Prinimala uchastiye: VOLKOVA, M.I., tekhnik

Effect of vacuum melting on the heat-resistance properties of iron alloys. [Trudy] TSNIITMASH 105:125-134 '62. (MIRA 15:8)

(Iron alloys--Thermal properties) (Vacuum metallurgy)

VOLKOVA, T.I., kand.tekhn.nauk

High-temperature tempering as a measure to increase the relaxation resistance in pearlitic steel. [Trudy] TSNIITMASH 105:87-97 '62. (MIRA 15:8)

(Steel--Heat treatment) (Strains and stresses)

VOLKOVA, T.I., kand.tekhn.nauk; PETROPAVLOVSKAYA, Z.N., kand.tekhn.nauk

Pearlitic steel for fastenings on power plant equipment with an operating temperature of 565-600 . [Trudy] TSNIITMASH 105:98-107 '62. (MIRA 15:8)
(Steel, Heat-resistant) (Steam turbines)

S/590/62/105/000/007/015
I031/I242

AUTHORS: Volkova, T.I., and Petropavlovskaya, Z.N., Candidates of Technical Sciences

TITLE: Perlitic steel for joints in power equipment operating at temperatures of 565-600°C

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya. Trudy. v.105, 1962, 98-107

TEXT: The development of perlitic steels with a relaxation constant of at least 10 000 = 10 kg/mm² at 565°C is difficult. Two specimens of perlitic steel 25Kh 1M 1 1 (25Kh 1M 1F 1BR), a laboratory alloy 10 (TsZh10) and an industrial alloy 44 (EP 44) were heated to 1100°C, then air-cooled, and tempered at 730°C for 5 hours. As a result of the high tempering temperature, Brinell hardness dropped to 230 but the desired structural stability and creep behavior were achieved. The EP44 specimens have a sorbite

Card 1/2

Perlitic steel for joints...

microstructure with coagulated carbide particles located at the grain boundaries and within their body. The tensile properties and ductility satisfy the requirements for steel. A stress-relaxation test was made at 565-580°C and 600°C. The initial load for the Ts2h10 specimens was 25 and 30 kg/mm^2 at 580°C and testing time - 10 000 hrs. Other specimens were tested for 4000 hrs at initial loads of 30 kg/mm^2 and 10000 was obtained by extrapolation. Relaxation resistance varied between 10 and 15 kg/mm^2 which is sufficient for bolting steel. The stress-rupture strength of smooth specimens was 20 kg/mm^2 for a 20 000 hrs test at 565°C, while notched specimens showed 1.5-2.0 kg/mm^2 less strength. Due to low Cr content (1.5%), the 25Kh 1M 1F 1BR steel has low corrosion resistance and should be protected by a suitable coating. There are 6 figures and 6 tables.

Card 2/2

S/590/62/105/000/009/015
I031/I242

AUTHORS: Mirkin, I.L., Dr. of Technical Sciences, Volkova, T.I., Candidate of Technical Sciences, and Blanter, M.S., Eng.

TITLE: Effect of vacuum melting on heat-resistant properties of iron alloys

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya. Trudy. v.105, 1962, 125-134

TEXT: The present work was carried out because of the absence of information on the influence of vacuum melting on relaxation and creep behavior in high-temperature alloys. Four grades of iron-base steels were investigated: pure iron; non-hardenable single phase Fe-Cr-Ni steel; slow aging alloy with Mo and W added, and an alloy highly susceptible to aging, with Mo, W, Ti, Al and Nb added. Melting was performed in an induction furnace at a pressure of 1.10^{-4} - 5.10^{-5} mm Hg. Short-term mechanical properties, stress-

Card 1/2

S/590/62/105/000/009/015
I031/I242

Effect of vacuum melting...

rupture strength , relaxation, and creep resistance were tested. As a result of vacuum melting relaxation and creep resistance increased with increasing complexity of the chemical and phase composition of steel. High-alloy steels gain stress-rupture strength and lose ductibility, while vacuum melting of low-alloys improves their ductility to some extent but does not influence a long-term strength behavior. Optimal heat-resistant properties may be gained by applying vacuum melting and pouring with alloys of more complex chemical and phase composition than that suggested for conventional melting. There are 5 figures and 5 tables.

Card 2/2

40976

S/659/62/009/000/006/030
I003/1203

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AUTHORS Gertsriken, S. D., Slastnikova, L. F., Yatsenko, T. K., Volkova, T. I., and Mirkin, I L.

TITLE: The relationship regularities in the diffusion of nickel in nickel-base alloys and the refractory properties of these alloys

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam. v. 9. 1962. Materialy Nauchnoy sessii po zharoprochnym splavam (1961 g.), 42–46

TEXT. Data on the mobility of atoms at elevated temperatures are necessary for the investigation of heat resistant alloys. Such data were obtained here for different grades of nickel and of nickel-base alloys containing Cr, W, Mo and Co. A layer of radioactive Ni^{63} was electrolytically deposited on polished samples, which were heated to a temperature range from 970°C to 1170°C. The diffusion coefficient of nickel was calculated from the difference in the radioactiveity of the surface before and after heating. The self-diffusion coefficients were calculated: for refined nickel: $D = 0.36 \exp(-64700/RT)$ cm^2/sec; for commercial nickel: $D = 0.25 \exp(-63006/RT) cm^2/sec$. Diffusion coefficients of nickel into both refined and commercial grade alloys were calculated, and the mechanical properties as well as the melting points of the alloys were determined. The conclusion reached are that the long-time strength and the resistance to relaxation of nickel-base alloys

Card 1/2

at 800°C is due chiefly to the structure and to the dislocations in the alloy, and that the thermal mobility of atoms of the chief components is of lesser importance. In the discussion, E. M. Pivnik expressed the opinion that the relationship between the diffusion in nickel-base alloys and their heat-resistance may be more complex than suggested by the authors, while, A. Ya. Shinyaev believed that may be premature to draw conclusions on the relationship between the heat-resistance of alloys and the diffusion at low temperatures. There are 2 figures and 2 tables.

VOLKOVA, T.I., kand.tekhn.nauk; PETROPAVLOVSKAYA, Z.N., kand.tekhn.nauk

Pearlite EP44(TsZhl0) steel with relaxation resistance at temperatures ranging from 565 C to 600 C. Energomashinostroenie 8 no.1:33-36 Ja '62. (MIRA 15:3)
(Steel--Testing)

S/124/62/000/007/026/027
D234/D308

AUTHOR: Volkova, T. I.

TITLE: Correlation of the relaxation stability of perlitic steel with other properties

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 7, 1962, 65, abstract 7V497 (V sb. Issled. novykh zharoprochn. splavov dlya energetiki. M., Mashgiz, 1961, 87-99)

TEXT: Properties of perlitic steel alloyed in different ways are confronted with its relaxation properties. 18 compositions of steel are studied, containing 0.11 to 0.25% C and small amounts of alloying additions (up to 6 elements). Loss of strength during tempering, stability of mechanical properties during ageing, composition of solid solution and its stability in ageing, composition and type of carbide phases and their coagulation are studied. It is conluded that relaxation stability of perlitic steel, large or small, cannot be explained even qualitatively by such properties as stability

Card 1/2

Correlation of the ... S/124/62/000/007/026/027
D234/D308

against loss of strength in tempering, magnitude of mechanical properties at high temperatures and their constancy on ageing. [Abstracter's note: Complete translation.]

Card 2/2

VOLKOVA, T.I., kand.tekhn.nauk

Relation between the relaxation stability of pearlitic steel with its other properties. [Trudy] TSNIITMASH 101:87-94 '61.
(MIRA 14:10)

(Steel--Testing) (Phase rule and equilibrium)

S/137/62/000/004/118/201
A052/A101

AUTHOR: Volkova, T. I.

TITLE: On the problem of the connection of relaxation resistance of perlitic steels with its other properties

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 54, abstract 4I318 (V sb. "Issled. novykh zharoprochn. splavov dlya energetiki", Moscow, Mashgiz, 1961, 87 - 99)

TEXT: A higher or lower relaxation resistance of perlitic steel cannot even qualitatively be explained by such its properties as the resistance to temper softening, the level of mechanical properties at a high temperature and their stability in the process of aging. The alloyage of the solid solution is of no decisive importance for the relaxation resistance of perlitic steel. The decisive factor is the type of the strengthening phases and their stability in time. The best relaxation resistance is displayed by steels having V carbide (in steels with Nb also NbC) as the only strengthening phase and showing no tendency to the formation of new phases in the process of aging. T. Rumyantseva

[Abstracter's note: Complete translation]
Card 1/1

34667
S/114/62/000/001/004/006
E193/E383

18.1150

AUTHORS: Volkova, T.I. and Petropavlovskaya, Z.N., Candidates of Technical Sciences

TITLE: Pearlitic steel ЭП44 (ЭИ10) (EP44(TsZh10))

PERIODICAL: Energomashinostroyeniye, no. 1, 1962, 33 - 36

TEXT: In continuation of an earlier work (Ref. 1 - Metallovedeniye i termicheskaya obrabotka metallov, no. 2, 1961) the present authors studied the high-temperature properties of steel 25ХМ1Ф1Б (25KhlM1F1B) designed as a material for reinforcing details of turbines operating at 565 °C. A tentative code mark, TsZh10, has been alotted to this teel which, in industrial practice, is known as steel EP44. The chemical analysis is given in Table 1. The optimum treatment of this steel consisted of heating to 1 100 °C, air-cooling and tempering for 5 hours at 730 °C, high-temperature tempering being necessary to ensure relaxation stability in service. After this treatment the steel constituted a mixture of ferrite with uniformly distributed coarse carbide particles. Some mechanical properties of the steels studied are given in Table 2. The results of relaxation tests, carried out in the

Card 1/3

Pearlitic steel ....

course of the present investigation on ring specimens at 565, 580 and 600 °C, are reproduced in Table 3, the values in brackets being obtained by extrapolation which, as had subsequently been established, gave values slightly lower than the actual. The temperature dependence of the relaxation stability is shown in Fig. 4, where the stress (σ, kg/mm^2) after 10 000 hours is plotted against test temperature (°C), the experimental points denoted by crosses, dots and triangles relating, respectively, to a specimen of a laboratory melt (TsZh10) tested under an initial stress σ_o = 30 kg/mm^2, a specimen of an industrial melt (EP44), tested under σ_o = 30/kg/mm^2 and a specimen of EP44 tested under σ_o = 25 kg/mm^2; the broken horizontal line corresponds to the value of σ, as specified in TU . The results of creep tests carried out at 565 °C on cylindrical specimens (10 mm in diameter, 100 mm gauge length) normalized at 1 100 °C and

Card 2/9

Pearlitic steel ....

tempered for 6 hours at 725 °C are reproduced in Fig. 5, where σ is plotted against time-to-rupture (hours) in logarithmic coordinates, crosses and dots relating to unnotched and notched specimens, respectively. Finally, the results of oxidation-resistance tests are reproduced in Fig. 6, where the increase in weight (g) of specimens heated in air at 600 °C is plotted against time (hours) at temperature; Curves 1-4 relate to various steels listed under the same numbers in Table 6, where the values of σ after 10 000 hours at 580 °C (σ_o = 30 kg/mm^2) are given. Data in Fig. 6 and Table 6 showed that an attempt to increase the oxidation-resistance of steel TsZh10 by increasing its Cr and Mo contents and by introducing W brought about a sharp decrease in its relaxation stability. It was concluded that high relaxation stability of the steel studied and its good mechanical properties at room and elevated temperatures, combined with high creep-resistance which is hardly affected by the presence of stress-risers (notches), render this steel suitable for reinforcing details in turbines

Card 3/9

VOLKOVA, T.I., kand.tekhn.nauk

Changing the constitution of pearlitic steel in order to increase its relaxation stabaility at 580°. Metalloved. i term. obr. met. no.2:11-16 F '61. (MIRA 14:3)

1. Tsentral'nyy nuachno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Steel—Metallography) (Metals at high temperature)

KONSTANTINOV, N.N.; VOLKOVA, T.I.

Inhibited germination and biological significance of seed hairs and coat in the genus Gossypium. Trudy Glav.bot. sada 7:127-151 '61. (MIRA 14:3)

(Cottonseed) (Germination)

18.8200

S/129/61/000/002/002/014
E193/E483

AUTHOR: Volkova, T.I., Candidate of Technical Sciences

TITLE: Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No.2, pp.11-16

TEXT: The object of the investigation described in the present paper was to explore the possibility of raising the relaxation stability of pearlitic steels at 580°C to a value $\sigma_{10000} > 10$ kg/mm^2, by adjusting their composition. For standard of reference, a pearlitic steel containing 0.2 to 0.25% C, 1.0 to 1.3% Cr, 0.3 to 0.6% V and 0.9 to 1.1% Mo was chosen; symbol D is used in the subsequent paragraphs to denote the nominal composition of this material. The composition of all the experimental alloys is given in Table 1. Each alloy was melted in a 150 kg furnace and cast into two ingots: one with and one without the niobium addition. Each fraction was investigated in both as-cast and forged condition. The preliminary treatment, in the case of the niobium-free specimens, consisted in normalizing at 1030°C; the niobium-bearing specimens were normalized (air-hardened)

Card 1/8

S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

at 1090°C and then tempered at 730°C for 5 h, after which the hardness of the steel was approximately 35% lower than its maximum value. A comparative study of the relaxation stability was carried out in the equipment of the ИР-1 (IR-1) type with the aid of the method of ring test pieces. The tests (5000 to 10000 h duration) were carried out at 580°C on two test pieces subjected to an initial stress σ_0 of 30 and 25 kg/mm^2. The average values of σ_{10000} kg/mm^2 are shown in Fig.1, histograms b and a relating to steels with and without the niobium addition, respectively; two different types of shading indicate the results obtained under σ_0 = 25 and 30 kg/mm^2; letters Л and К denote the cast and forged material. It will be seen that the difference in σ_{10000} of cast and forged specimens of all steels studied was small, amounting to 4.4 to 2.5 kg/mm^2. The relaxation stability of cast steels, determined after a 500 h test, was considerably higher than that of the forged material but it decreased on increasing the duration of test to 10000 h. The relaxation stability in the

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

initial and final stages of the test is characterized by $S_o = \sigma_o'/\sigma_o$ and t_o respectively. The effect of composition of this steel and its structural state on these characteristics is shown in Table 2. The data given in Table 2 were used to construct diagrams showing the effect of various alloying additions on S_o, t_o and σ_{10000} of the steels studied. The following conclusions were reached:
(1) The interaction of additional quantities of alloying elements (Cr, Mo, V, W, Co and Si) to the pearlitic steel of composition D greatly affects its relaxation stability at 580°C, as indicated by the wide range (1 to 14 kg/mm^2) of σ_{10000} of the alloys studied.
(2) Steel VII (D + 0.5 V + 0.19 Nb) displays highest relaxation stability. In this respect, it meets the service requirements in both the as-cast and forged conditions, σ_{10000} of this alloy (determined at 550°C under σ_o = 30 kg/mm^2) being 13.8 kg/mm^2. The relaxation stability of steel VII is considerably reduced by introduction of Cr, Mo, W, Si, or by decreasing its vanadium content.
Card 3/8

30

89671
S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

(3) Addition of chromium to steel I (D) and molybdenum to steels II (D + 1 Cr) and VII (D + 0.5 V) brings about a particularly sharp decrease in the relaxation stability of these materials.
(4) Addition of cobalt to the niobium-free steel II (D + 1 Cr) increases its relaxation stability in the initial stages of the process and decreases it in the final stages, causing at the same time a decrease in the magnitude of σ10000. The effect of cobalt addition on the relaxation properties of the niobium-bearing steels II and VII is detrimental.
(5) Relaxation stability of all the steels studied (in both as-cast and forged condition) is considerably increased by the addition of 0.1 to 0.15% niobium.
Acknowledgments are made to Engineer V.F.Ivanova who participated in this work. There are 5 figures and 2 tables.

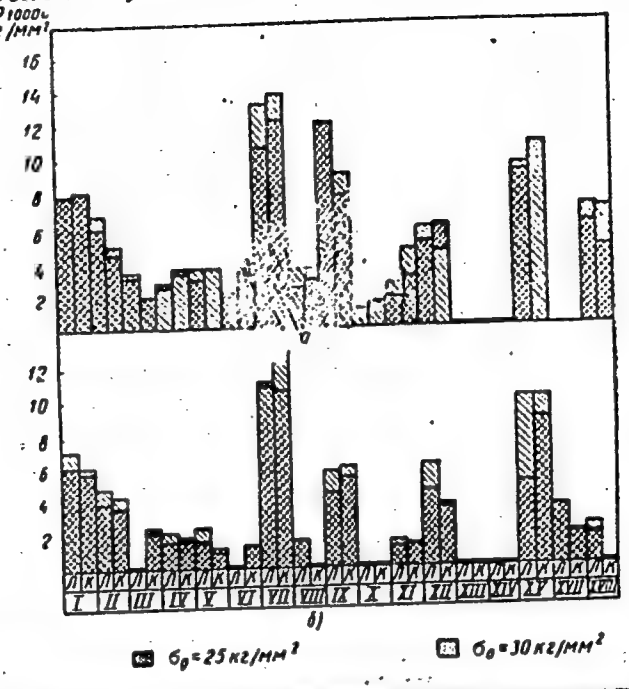
ASSOCIATION: TsNIITMASh

Card 4/8

S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

Fig.1.



Card 5/8

89671

S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

Table 1. Legend:

(1) Group
(2) Composition number
(3) Analysis %
(4) Others

* A part of the specimens of each heat contained no Nb.

Table 2. Legend:

(1) No. of the alloy
(2) Without niobium
(3) With niobium
(4) σ_{10000} at σ_0 = 30 kg/mm^2
(5) Cast
(6) Forged

Card 6/8

S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

Химический состав и индексы исследуемых сталей Table 1.

Группа	№ состава	Условный состав	Химический состав в %						
			C	Cr	Mo	V	W	Nb*	Другие
а	I	D	0,25	1,25	1,07	0,57	—	0,19	—
	II	D + 1 Cr	0,21	2,28	1,1	0,54	—	0,17	—
	III	D + 1 Cr + 1 Mo	0,24	2,26	2,45	0,56	—	0,16	—
	IV	D + 1 Cr + 2,5 W	0,26	2,35	1,20	0,48	2,50	0,17	—
	V	D + 1 Cr + 2 Co	0,24	2,39	1,18	0,58	—	0,16	2,24% Co
	VI	D + 1 Cr + 1 Mo + 2,5 W	0,24	2,34	2,38	0,45	2,0	0,12	—
б	VII	D + 0,5 V	0,23	1,03	0,96	0,88	—	0,14	—
	VIII	D + 0,5 V + 0,5 Si	0,21	1,35	1,09	0,88	—	0,16	0,93% Si
	IX	D + 0,5 V + 1 Cr	0,26	2,52	0,96	0,77	—	0,14	—
	X	D + 0,5 V + 1 Mo	0,25	1,51	2,46	0,75	—	0,15	—
	XI	D + 0,5 V + 2,5 W	0,24	1,23	0,98	0,82	2,50	0,25	—
	XII	D + 0,5 V + 2 Co	0,22	1,41	1,15	0,83	—	0,16	2,01% Co
	XIII	D + 0,5 V + 1 Mo + 2,5 W	0,24	1,21	2,14	0,93	2,50	0,13	—
	XIV	D + 0,5 V + 1 Cr + 1 Mo + + 2,5 W	0,21	2,32	2,46	0,92	2,60	0,16	—
	XV	D + 0,5 V — 0,1 C	0,13	1,28	0,88	0,84	—	0,15	—
	XVII	D + 0,5 V + 1 Mo — 0,1 C	0,11	0,9	2,25	0,67	—	0,16	—
	XVIII	D + 0,5 V + 1,5 W	0,23	1,42	1,12	0,82	1,50	0,28	—

* Часть образцов каждой плавки не содержала ниобия.

Card 7/8

89671
S/129/61/000/002/002/014
E193/E483

Improving the Relaxation Stability of Pearlitic Steel at 500°C by Changing its Composition

Table 2.

Релаксационная стойкость перлитной стали на I и II этапах процесса при 580°

№ состава	Без ниобия						С ниобием					
	S_0		f_0		σ_{1000} при σ_0 30 кг/мм²		S_0		f_0		σ_{1000} при σ_0 30 кг/мм²	
	Литая	Кованая	Литая	Кованая	Литая	Кованая	Литая	Кованая	Литая	Кованая	Литая	Кованая
I	0,48	0,45	15900	21600	7,0	5,7	0,58	0,41	14000	15950	7,8	8,0
II	0,48	0,44	13050	9750	3,8	4,3	0,29	0,25	15700	17300	6,5	4,5
III	0,30	0,27	10950	7250	—	2,4	0,30	0,22	3900	11000	3,2	1,8
IV	0,36	0,30	7250	11650	2,2	1,7	0,32	0,25	6550	7200	2,4	3,2
V	0,43	0,37	7400	5750	2,4	1,0	0,49	0,48	5000	4000	3,4	3,4
VI	0,28	0,25	7050	11500	—	1,3	0,20	0,24	4750	5000	1,9	3,2
VII	0,59	0,65	32700	32100	11,0	13,2	0,56	0,56	27850	35300	13,0	13,8
VIII	0,35	0,42	5500	5600	—	—	0,37	0,34	4250	3350	2,4	2,2
IX	0,55	0,53	29700	17800	5,7	6,0	0,45	0,41	9000	14900	12,2	9,2
X	0,16	0,26	4850	5300	—	—	—	—	—	—	1,0	1,4
XI	0,51	0,53*	5150	7050*	1,2	1,4	0,35	0,43*	4600	7850*	2,9	4,5
XII	0,46	0,53	11600	10800	6,2	3,7	0,42	0,36	12600	9750	5,0	4,3
XIII	0,43	0,32	3150	3900	—	—	0,28	0,30	3050	1800	—	—
XIV	0,13	0,25	—	—	—	—	0,19	0,17	—	—	—	—
XV	0,54	0,44	22700	59950	5,1	10,0	0,48	0,49	20600	22400	9,4	9,9
XVII	—	—	—	—	—	—	0,45	0,34	8100	6550	—	—
XVIII	0,55	0,58	13000	9300	2,3	—	0,47	0,57	5500	4500	7,0	6,9

Card 8/8

* Данные получены путем экстраполяции с 1500 ча с.

VOLKOVA, T.I., kand.tekhn.nauk

Development of work connected with the selection of materials for flat springs for steam turbines. [Trudy] TSNIITMASH 100:259-269 '59. (MIRA 13:7)
(Steam turbines)
(Metals--Thermal properties)

VOLKOVA, T.I., kand.tekhn.nauk

Analyzing the results of stress relaxation testing by various methods. [Truly] TSNIIMASH no.73:225-236 '59. (MIRA 12:7)
(Strains and stresses--Testing)
(Steel, Structural--Testing)

VOLKOVA T. I.

p 7 9

18(3) PHASE I BOOK EXPLOITATION SOV/2103

Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya

Struktura i svoystva zharoprochnykh materialov; [sbornik] (Structure and Properties of Heat-resisting Materials; Collection of Articles) Moscow, Mashgiz, 1959. (Series: Its: [Trudy] kn. 93) Errata slip inserted. 4,000 copies printed.

Additional Sponsoring Agencies: USSR. Gosudarstvennaya planovaya komissiya and Glavnoye upravleniye nauchno-issledovatel'skikh i proyektnykh organizatsiy.

Ed.: Z.N. Petropavlovskaya, Candidate of Technical Sciences; Ed. of Publishing House: N.A. Ivanova; Tech. Ed.: A. F. Uvarova; Managing Ed. for Literature on Metal Working and Tool Making: R. D. Beyzel'man.

PURPOSE: This book is intended for workers of scientific research institutes and for engineering staffs of plant laboratories of the boiler and turbine industries and power stations. It may also be useful to staff members of higher educational institutions studying problems of physical metallurgy.

Card 1/9

COVERAGE: This collection of articles describes results of work done at TsNIITMASh on the strength of materials used constantly at high temperatures in power plants. The articles deal with problems of heat resistance, alloying, and the production and heat treatment of heat-resistant steels. The evaluation of properties of industrial materials used under high and ultra-high pressures is given, and modern testing methods are discussed. No personalities are mentioned. References follow several of the articles.

TABLE OF CONTENTS:

SECTION IV. PAPERS ON METHODS

SOV/124-58-2-2363

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 2, p 114 (USSR)

AUTHOR: Volkova, T. I.

TITLE: 50,000-hour Relaxation Tests at Ambient Temperature (50,000-chasovyye ispytaniya na relaksatsiyu pri komnatnoy temperature)

PERIODICAL: V sb.: vopr. metalloved. kotloturbinnykh materialov. Moscow, Mashgiz. 1955, pp 81-85

ABSTRACT: Bibliographic entry

Card 1/1

SOV/137-57-10-20170

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 10, p 251 (USSR)

AUTHOR: Volkova, T.I.

TITLE: Fatigue Testing of Spring-steel Relaxation (Dlitel'nyye ispytaniya na relaksatsiyu pruzhinnoy stali)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov. Moscow, Mashgiz, 1957, pp 149-158

ABSTRACT: A description is presented of a relaxation (R) test of spring steel at 410 and 470°C and at various initial stresses run for 10,000 hours with the object of verifying the correctness of extrapolations previously made on the basis of the results of 2500-3500 hour tests. Flat springs (S) of steels 4Kh13, R18, and EI290, and a laboratory heat of TsZh-4 steel, each measuring 175x25x1.5 mm are tested on special apparatus. The loading system is a beam supported at 2 points with a bending stress applied midway. The accuracy of flexure measurement is ± 0.01 mm, the precision of temperature control is ±5°. Before testing, S of R18 steel are chromium-plated, and those of 4Kh13 are peened with iron shot to harden the surface. The following are taken as the basic criteria of relaxation strength: The

Card 1/2

Fatigue Testing of Spring-steel Relaxation

$\sigma_{10,000}$ stress remaining after the 10,000-hour test and the time $t_{\sigma=25}$ during which the stress diminishes to the minimum permissible value of 25 kg/mm^2. S hardened on one side are tested for relaxation so as to cause the hardened layer to work under tension. It is shown that at 410° an R test of 2000-2500 hours duration is adequate to provide reliable extrapolations for 10,000 hours service life. The error in this case does not exceed 10% in the magnitude of the $\sigma_{10,000}$. At 470° it is necessary to increase the tests to 4500-5500 hours if the extrapolations are to be dependable. This is due to the greater duration of the first stage R in the steels investigated at 470°. The correctness of the recommendation that the tempering of 4Kh13 steel be raised from 420 to 550° and that the duration thereof be increased from 2 to 10 hours is confirmed. When this is done, relaxation strength rises as much as 50% in $\sigma_{10,000}$ and even more for $t_{\sigma=25}$, at all initial stresses.

L.G.

Card 2/2

SOV/124-58-4-4875

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 4, p 166 (USSR)

AUTHORS: Tseytlin, V. Z., Volkova, T. I.

TITLE: Investigation of Relaxation Process in Metals by the I. A. Oding Method (Issledovaniye protsessa relaksatsii napryazheniy v metallakh metodom I. A. Odinga)

PERIODICAL: V sb.: Prochnost' metallov. Moscow, AN SSSR, 1956, pp 41-49

ABSTRACT: Some laws governing stress relaxation and factors affecting the process are experimentally investigated by the method of relaxation with the aid of annular specimens as proposed and developed by I. A. Oding in 1944. Results of determination of quantitative characteristics of flexural stress relaxation are presented. The influence of numerous factors, both external (temperature, stress, time) and internal (chemical composition and structural state of the material), affecting the process of relaxation have been studied. Recommendations are tendered as to the content of the alloying elements (Cr, Mo, V) that increase the resistance to relaxation of low-carbon steels for various temperatures. The relationship between relaxation

Card 1/2

SOV/124-58-4-4875

Investigation of Relaxation Process in Metals (cont.)

stability and chemical composition of austenite steels was studied. Results of the experiments are compiled in tables and graphs.

Yu. G. Maksimov

1. Metals--Mechanical properties 2. Metals--Chemical properties
3. Metals--Structural analysis 4. Metals--Mathematical analysis

Card 2/2

SOV/124-58-5-6172

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 159 (USSR)

AUTHOR: Volkova, T.I.

TITLE: Long-term Investigation of the Relaxation of Spring Steel (Dlitel'nyye ispytaniya na relaksatsiyu pruzhinnoy stali)

PERIODICAL: V sb.: Ispytaniya i svoystva zharoprochn. materialov. Moscow, Mashgiz, 1957, pp 149-158

ABSTRACT: Results of long-term relaxation tests (up to 10,000 hours) are presented for 4Kh13, R18, EI290, and TsZh-4 (EI723) grades steel tested at 410° and 470°C under varying initial stresses. At 470°C the highest relaxation stability was demonstrated by TsZh-4-type steel. For $\sigma_{10,000}$ value it surpassed R18 steel by 35-40%. At 410°C the highest relaxation stability was demonstrated by R18 steel. Extrapolations performed on the basis of less than 2,500-hour test duration results were not wholly substantiated.

G.A. Tulyakov

1. Steel--Mechanical properties 2. Steel--Test methods 3. Springs --Materials

Card 1/1

AUTHOR: Volkova, T.I. 32-24-4-44/67

TITLE: The Dependence of the Relaxation Test Methods on the Test Method (Zavisimost' kriteriyev relaksatsii ot metoda ispytaniya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 4, pp. 473-476 (USSR)

ABSTRACT: The two most-spread methods of testing relaxation, the ring bending- and the flat spring method, give different tension diagrams in the working part of the sample. In the case of the ring, the working element has the form of a board, and tension is uniformly distributed, whereas, in the case of a spring leaf, there is a maximum tension in the center part. In cooperation with V.F.Ivanova experiments were carried out according to both methods with perlite steel of the type EI 723 with 0.20% C, 0.28% Si, 0.74% Mn, 2.35% Cr, 0.95% Mo and 0.4% V with normalization at 1030-1050° for six hours. Tests were carried out at 500°, 525° and 550° and initial tensions of 25, 30 and 35 kg/mm^2, with stress lasting from 3600 to 4000 hours in IR-1 and IR-4 furnaces. The average values obtained are graphically recorded. From the diagram it may be seen that after 500 and 10000 hours residual stresses show a minimum difference between ring and spring. It was found that in the first stage

Card 1/2

the relaxation process is more intense in the rings than in the springs, whereas in the second stage the opposite is the case, so that, in the case of investigations of longer duration, a lower residual stress is to be expected in the springs than in the rings. If the material investigated has a relatively good relaxation resistance in the first, and a bad one in the second stage, results will be higher in the rings than in the springs. It follows from results obtained by investigation that the two methods are equivalent, but that they cannot give a uniform qualitative series in the case of comparative experiments. There are 4 figures, and 1 table.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute for Technology and Machine Building)

1. Steel--Stresses 2. Steel--Test methods

VOLKOVA, T.I., kand. tekhn. nauk; GRIBOYEDOV, Yu.N., kand. tekhn. nauk.

Protecting EI723 steel springs from high temperature oxidation. Metalloved. i obr. met. no.5:37-40 My '58. (MIRA 11:5)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnolgii i mashinostroeniya.

(Springs (Mechanisms)--Corrosion)
(Steel--Metallography) (Protective coatings)

SOV-129-58-6-6/17

AUTHOR: Volkova, T. I. (Cand.Tech.Sc.)

TITLE: Increase to 640°C of the Operating Temperature of the Material of Flat Sealing Springs of Steam Turbines (Povysheniye do 640° rabochey temperatury materiala ploskikh pruzhin uplotneniy parovykh turbin)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 6, pp 21-25 (USSR)

ABSTRACT: There is an acute demand for finding a spring steel capable of operating at 585-640°C. The technical requirement is that, after 10 000 hours at the operating temperature, the residual stress in the spring should not be below 12 kg/mm^2. Relaxation tests were made on several Soviet and foreign grades of austenitic steels and also on nickel alloys with a chemical composition and heat treatment as entered in Table 1 and mechanical properties at 20 and 585°C, as entered in Table 2. Relaxation tests of specimens of 175 x 25 x 1.5 mm were effected according to the standard TsNIITMASh technique on IR-4 equipment. At 585°C all the materials were tested with initial stresses of 22 and 42 kg/mm^2 and the materials with high yield points (EI437, Niconel X, EI765) were additionally tested at 60 kg/mm^2. According to each regime two specimens were tested and in

Card 1/4

Increase to 540°C of the Operating Temperature of the Material of Flat Sealing Springs of Steam Turbines

the evaluation the average values were used. The duration of the testing of the individual specimens was 2100 to 4300 hours. Those of the materials which showed a high relaxation stability at 585°C were additionally tested at 640°C with the initial stresses of 40 and 60 kg/mm^2. The average results of the relaxation tests are entered in Table 3. The values of the main characteristic of the relaxation strength $\sigma_{10\ 000}$ for the initial stresses of 22, 40 and 60 kg/mm^2 for all the investigated materials are graphed in Fig.1, p.21 (a dotted line indicates the stress level corresponding to the technical specifications). The obtained results indicate that all the investigated materials except for the steel N 153 satisfy the technical requirements. For the steels EI612, EI673 and the alloy EI765, the operating temperature can be increased up to 640°C. As regards the relaxation strength at 585°C, the investigated materials can be grouped in the following sequence: EI612, EI765, EI763, Niconel X., 19-9DL, EI437, N153. Taking into consideration

Increase to 640°C of the Operating Temperature of the Material of Flat Sealing Springs of Steam Turbines

the relaxation strength, mechanical properties, the rate of use by industry, the cost and the scarcity of the alloying elements, the use of the steel EI612, of the alloy EI765 and also of the steel EI673 is recommended for producing flat spring labyrinth springs operating at 585 and 640°C (the recommendation of the steel EI673 for temperatures up to 640°C is tentative only since the respective relaxation tests have not been carried out at this temperature). These materials are approximately equivalent as regards the relaxation strength but they differ as regards cost and complexity of the heat treatment. On the basis of earlier published results and results of the here-described work it can be concluded that spring material has been found which is capable of operating at 640°C, i.e. under the limit conditions of operation of steam power generation equipment. The increase in the operating temperatures of flat springs during recent years (1951-1957) is shown in Fig.2, p.23. The dependence of the characteristics of the relaxation stability on the test temperature for steels recommended during various periods by TsNIITMASh is graphed in Fig.3.

Increase to 640°C of the Operating Temperature of the Material of Flat Sealing Springs of Steam Turbines

These data can be used as a guide in selecting spring steel grades for operation under conditions of stress relaxation at 400 to 600°C for 10 000 hours.
(This is a complete translation except for the first two paragraphs of the text, figure captions, table captions and headings). There are 3 tables, 3 figures and 3 Soviet references.

ASSOCIATION: TsNIITMASh

1. Springs - Materials 2. Springs - Effectiveness
3. Springs - Temperature factors 4. Steam turbines - Materials

Volkova T. I.

137-1957-12-25417

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 351 (USSR)

AUTHORS: Tseytlin, V. Z., Volkova, T. I.

TITLE: Employment of I. A. Oding's Method in the Investigation of Stress Relaxation in Metals (Issledovaniye protsessa relaksatsii napryazheniy v metallakh metodom I. A. Odinga)

PERIODICAL: V sb.: Prochnost' metallov. Moscow, AN SSSR, 1956, pp 41-49

ABSTRACT: An analysis of advantages of the ring method of testing metals for relaxation, as proposed by I. A. Oding ["Novyy metod ispytaniya na relaksatsiyu i polzuchest'" (A New Testing Method for Relaxation and Creep), 1949, Book 23, MAShGIZ], and an examination of certain laws governing the relaxation process when this method is employed. It is pointed out that the proposed method deserves wide use and that it may be successfully applied to the development of a theory of stress relaxation in metals, and to an evaluation of the relaxation stability of materials. With this method it is possible to obtain directly quantitative values for relaxation characteristics not only of parts subjected to bending, but also of parts operating under tension, such as bolts and dowels of boilers and turbines. Z. F.

Card 1/1

1. Metals-Stress analysis

VOLKOVA, T. I.

129-58-5-10/17

AUTHORS: Volkova, T. I. and Griboyedov, Yu. N., Candidates of Technical Sciences

TITLE: Protection of Springs Made of Steel EI723 Against Oxidation at High Temperatures (Zashchita pruzhin iz stali EI723 ot vysokotemperaturnogo okisleniya)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 5, pp 37-40 + 1 plate (USSR)

ABSTRACT: The pearlitic steel EI723 has been recommended for manufacturing flat springs of labyrinth seals of steam turbines since its relaxation stability at 470°C is considerably higher than that of the high speed steel R18 and is suitable for operation at 500 to 550°C. However, above 500°C this steel is not sufficiently stable against scaling and the surface becomes covered with a thick scale which splits off easily from the metal, changing the effective cross section of the spring and contaminating the slots. The aim of this paper was to develop a surface treatment of the flat springs which would enable increasing their corrosion stability without reducing their relaxation characteristics. The surface of the spring was investigated after thermo-diffusion treatment

Card 1/2

Protection of Springs Made of Steel EI723 Against Oxidation at High Temperatures

with powders of various compositions; by changing the regime of the diffusion saturation differing layer thicknesses were obtained. An attempt has been made to combine the surface treatment with the main heat treatment. The characteristics of the investigated surface treatment are briefly enumerated in Table 1, p 38, which consisted of different variants of diffusion-chromating and alitizing. On the basis of the obtained results it is concluded that thermo-diffusion chromating (8 hours at 1000°C, cooling of the box in the furnace with a resulting diffusion layer thickness of 7 to 12 μ) of springs made of the steel EI723 will provide a protection against their oxidation at temperatures up to 550°C without reducing appreciably the relaxation stability. In choosing the type of protection it is necessary first to be convinced that such a protection is really necessary in order to prevent contamination of the slots by scale which will inevitably peel off at operating temperatures exceeding 500°C. Furthermore, it is necessary to take into account that there will be a certain reduction of the relaxation stability of the material. There are 1 figure and 3 tables.

Card 2/2

ASSOCIATION: TsNIITMASh

AVAILABLE: Library of Congress.

1. Springs-Oxidation-Preventive measures 2. Springs-Corrosion-Temperature factors

VOLKOVA, T.I.

Dependence of relaxation criteria on the testing method. Zav.lab. 24 no.4:473-476 '58. (MIRA 11:4)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.
(Creep of metals)

VOLKOVA, T.M.

Nontraumatic diaphragmatic hernia of the right side. Vest. khir. 75 no.6:132-144 Jl '55. (MLRA 8:10)

1. Iz khirurgicheskogo otdeleniya (zav.M.I.Persl'man) Shcherbakovskogo bol'nichnogo gorodka. g. Shcherbakov, bol'nichnyy gorodok.

(HERNIA, DIAPHRAGMATIC, diag.
in nontraumatic cases)

BIRYUZOVA, V. I.; VOLKOVA, T. M.; MEYSEL, M. N.

"The effect of growth conditions upon the ultrastructure of yeast cell mitochondria."

report submitted for 3rd European Regional Conf, Electron Microscopy, Prague, 26 Aug-3 Sep 64.

BIRYUZOVA, V.I.; ZVYAGIL'SKAYA, R.A.; MALATYAN, M.N.; VOLKOVA, T.M.

Electron microscopic and cytochemical study of mitochondria from yeast cells. Mikrobiologiia 33 no.3:442-446 My-Je '64. (MIRA 18:12)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR i Institut biokhimii imeni A.N.Bakha AN SSSR. Submitted June 27, 1963.

BIRYUZOVA, V.I.; VOLKOVA, T.M.

Electron microscopic and cytochemical study of the Golgi apparatus in yeast cells. Dokl. AN SSSR 153 no.5:1180-1182 D '63. (MIRA 17:1)

1. Institut radiatsionnoy i fiziko-khimicheskoy biologii i Institut mikrobiologii AN SSSR. Predstavleno akademikom A.A. Imshenetskim.

SOKUROVA, Ye.N.; VOLKOVA, T.M.

Biochemical mutations in Torulopsis utilis following the action of ionizing irradiations. Radiobiologiia 2 no.1:36-42 Ja '62 (MIRA 18:1)

MEYSEL', M.N.; REMEZOVA, T.S.; BIRYUZOVA, V.I.; GAL'TSOVA, R.D.; MEDVEDEVA, G.A.; POMOSHCHNIKOVA, N.A.; SELIVERSTOVA, L.A.; POGIAZOVA, M.N.; KOVICHKOVA, A.T.; VOLKOVA, T.M.

Cytophysiological and biochemical studies of yeasts during their recovery following radiation injury. Izv. AN SSSR. Ser. biol. no.6: 827-851 N-D '64. (MIRA 17:11)

1. Institute of Microbiology, Academy of Sciences of U.S.S.R., and Institute of Radiation and Physico-Chemical Biology, Academy of Sciences of U.S.S.R., Moscow.

MEYSEL', M.N.; MEDVEDEVA, G.A.; BIRYUZOVA, V.I.; VOLKOVA, T.M.

A comparative study of the microscopic and ultramicroscopic structure of cells of the yeasts Saccharomyces vini and Rhodotorula glutinis. Mikrobiologiia 31 no.6:1011-1017 N-D '62. (MIRA 16:3)

1. Institut mikrobiologii AN SSSR i Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR.
(YEAST) (CELLS)

L 39032-66 EWT(m)/EWP(i) RM

ACC NR: AP6021756 (A) SOURCE CODE: UR/0328/66/000/002/0003/00006

AUTHOR: Chalov, N. V.; Loshchuk, A. Ye.; Kozlova, L. V.; Volkova, T. M.

ORG: VNIIGS

TITLE: Indices of hydrolysis of polysaccharides with 65-90% sulfuric acid at the equilibrium stage of the reaction

SOURCE: Gidroliznaya i lesokhimicheskaya promyshlennost', no. 2, 1966, 3-6

TOPIC TAGS: polysaccharide, hydrolysis, sulfuric acid, cellulose

ABSTRACT: The equilibrium in the system polysaccharides - sulfuric acid - water - products (glucose) was investigated. On a triangular diagram, the system under consideration (H_2SO_4 - water - glucose) is represented by a straight line. Graphical analysis of the hydrolyzate compositions showed that at room temperature this system consists of a solution of the compound $C_6H_{12}O_6 \cdot 1.37\ H_2SO_4$ in 62.5% sulfuric acid. The hydrolysis of polysaccharides virtually comes to a halt at a certain concentration of acid and sugars because of the formation of compounds between H_2SO_4 and the hydrolysis products, determined as glucose, so that the true concentration of the latter in the solution drops to 62.5% by weight. The H_2SO_4-glucose compound is analogous to that formed by reacting cellulose with liquid hydrogen chloride or by hydrolyzing cellulose with 38-50% hydrochloric acid. From the data obtained, the minimum possible specific consumption of H_2SO_4 insuring the complete hydrolysis of cellulose and polysaccharides

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at 20°C was determined. It is suggested that the specific consumption of H_2SO_4 can be considerably reduced by raising the H_2SO_4 concentration and the temperature of the hydrolysis process. Orig. art. has: 3 figures.

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 009/ OTH REF: 004

Card 2/2 egh

MEYSEL', M.N.; MEDVEDEVA, G.A.; BERYUZOVA, V.I.; VOLKOVA, T.[illegible]

Comparative study of the microscopic and ultramicroscopic structure of cells of irradiated Saccharomyces vini and Rhodotorula glutinis yeasts. Mikrobiologiia 33 no.2:270-277 Mr-Ap '64. (MIRA 17:12)

1. Institut mikrobiologii AN SSSR, Institut radiatsionnoy i fiziko-khimicheskoy biologii AN SSSR.

VOLKOVA, T. N., Cand Med Sci -- (diss) "Effect of glutamic acid on the decomposition and regeneration of red blood in children suffering from various ailments." Moscow, 1960. 14 pp; (Academy of Medical Sciences USSR, Order of Labor Red Banner Inst of Pediatrics); 270 copies; free; (KL, 27-60, 159)

BOGOMOLOVA, F.A. [Bohomolova, F.A.]; PROPENTOVA, V.N.; VOLKOVA, T.N.

Reflex reaction of the capillaries in children with rheumatic fever. Ped., akush. i gin. 19 no.6:39-41 '57. (MIRA 13:1)

1. 2-y Moskovskiy gosudarstvennyy meditsinskiy institut im. N.I. Pirogova (nauchnyy konsul'tant - prof. D.D. Lebedev, dir. - prof. O.V. Kerbikov).
(RHEUMATIC FEVER) (CAPILLARIES)

VOLKOVA, T.N.

FEDOTOVA, A.M.; VOLKOVA, T.N.

Modification of erythrocytes in various stages of scarlet fever. Pediatriia, Moskva No.3:25-32 May-June 50. (CIML 19:4)

1. Of the Department of General Pathology of the Child (Head -- Prof. N.M.Nikolayev) and of the Infectious Diseases Clinic (Head -- Honored Worker in Science Prof. A.I.Dobrokhotova), Insitute of Pediatrics of the Academy of Medical Sicences (Director of Institute-- Honored Worker in Science Prof. G.N.Speranskiy, Active Member of the Academy of Medical Sciences).

VOLKOVA, Z.N.; SHEVLYAGINA, Ye.V.

Studying the effect of the composition of a mixture of high molecular weight alcohols, obtained by different technological procedures, on the quality of the emulsifying agent for cosmetic emulsions. Trudy VNIISNDV no.4:197-199 '58. (MIRA 12:5)

(Emulsifying agents) (Alcohols) (Cosmetics)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V.; YANKOVSKAYA, S.A.; SHAPIRO, Ye.S.; KLIMANOVA, N.A.

Study of the process of esterification in the production of "pentol." Trudy VNIISNDV no.6:167-169 '63. (MIRA 17:4)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V., kand.khim.nauk

Determining the particle distribution of the constituents of face powders. Masl.-zhir.prom. 25 no.10:29-33 '59.
(MIRA 13:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskikh i natural'nykh dushistykh veshchestv.
(Cosmetics)

VOLKOVA, T.N.

Effect of glutamic acid on the hemopoietic system in children with Down's disease. Pediatriia 23 no. 5:81-84 My '60. (MIRA 14:1)
(MONGOLISM) (GLUTAMIC ACID) (HEMATOPOIETIC SYSTEM)

VOLKOVA, T.N.

VOLKOVA, T.N.

Erythrocyte changes in premature children. Pediatriia no.6:69-73 N-D '54. (MLRA 8:4)

1. Iz Instituta pediat. AMN SSSR (dir.-prof.M.N.Kazantseva)
(ERYTHROCYTES,
size changes in premature inf.)
(INFANT, PREMATURE, blood in
erythrocyte size changes)

VOLKOVA, T.N.; RUSSKIKH, Vadim

Use of glutamic acid and characteristics of excretion of certain amino acids in Down's disease. Zhur.nevr. i psikh. 56 no.9:750-756 '56. (MLRA 9:11)

1. Otdel obshchey patologii (zav. - prof. N.M.Nikolayev) i otdel izucheniya razvitiia mozga (zav. - prof. B.N.Kosovskiy) Instituta pediatrii AMN SSSR.

(MONGOLISM,
glutamic acid ther. & urinary amino acids (Rus))
(AMINO ACIDS, in urine,
in mongolism (Rus))
(GLUTAMATES, therapeutic use,
mongolism (Rus))

VOLKOVA, T.V.

GAL'PERIN, Ye.R., redaktor; GODELEVICH, V.P.; YEVTYANOV, S.I., redaktor; KEISS, P.Zh.; KUNINA, S.L.; POPOV, I.A.; SHTEYN, B.B., redaktor; VOLKOVA, T.V., redaktor; VEYNTRAUB, L.B., tekhnicheskiy redaktor.

[Problems on radiobroadcasting installations] Zadachnik po radioperedaiushchim ustroistvam. Pod red. S.I.Evtianova i E.R.Gal'perina. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1951. 175 p. (MLRA 7:12) [Microfilm]

(Radio--Problems, exercises, etc.)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V.

Preparation of a pentaerythrite and oleic acid ester (pentol) as a new emulsifier for cosmetic creams. Trudy VNIISNDV no.5: 120-122 '61. (MIRA 14:10)
(Cosmetics) (Pentaerythritol) (Oleic acid)

DERGACHEV, I.S., prof.; POTANOVA, I.N., kand.med.nauk; MIKHEYEVA, G.A.; VOLKOVA, T.N.

Some problems in the mechanism of action of biomycin (chlortetracycline). Report No.1: Effect of chlortetracycline on rabbits of different ages in relation to the dose, length of use, and method of administration. Pediatriia no.9:50-56 '61. (MIRA 14:8)

1. Iz Instituta pediatrii AMN SSSR (dir. - prof. O.D. Sokolova-Ponomareva).

(AUREOMYCIN)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V.; YAKOVLEVA, G.S.; DUCHINSKAYA, Yu.I.

Preparation of KO emulsifier and emulsifying waxes for cosmetic articles. Trudy VNIISNDV no.5:122-124 '61. (MIRA 14:10)
(Cosmetics) (Emulsifying agents)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V.

Fine grinding of powder and its components. Report No.1: Grinding in a vibration mill. Trudy VNIISNDV no.5:137-150 '61. (MIRA 14:10)

(Grinding machines) (Cosmetics)

VOLKOVA, T.N.; SHEVLYAGINA, Ye.V.

Fine grinding of powder and its components. Report No.2: Grinding in a jet mill. Trudy VNIISNDV no.5:151-160 '61. (MIRA 14:10)

(Grinding machines) (Cosmetics)

VOLKOVA, T.N.

Tumors of the adrenal cortex in children. Padiatriia 42 no.8: 25-28 Ag'63 (MIRA 17:4)

1. Iz detskogo otdeleniya (zav. - kand. med. nauk M.A. Zhukovskiy) Vsesoyuznogo nauchno-issledovatel'skogo instituta eksperimental'noy endokrinologii (dir. - prof. Ye.A. Vasyukova).